

Lava Beds National Monument

Curriculum Standards

The following curriculum standards for California and Oregon are covered in this activity binder. Each activity states which curriculum standards it relates to at the beginning of the activity.

CALIFORNIA

- **Grade 3**
SCIENCE

Life Sciences

3. Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept:
 - a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.
 - b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.
 - c. Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.
 - d. Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.
 - e. Students know that some kinds of organisms that once lived on Earth have completely disappeared and that some of those resembled others that are alive today.

- **Grade 4**
SCIENCE

Life Sciences

2. All organisms need energy and matter to live and grow. As a basis for understanding this concept:
 - a. *Students know* plants are the primary source of matter and energy entering most food chains.
 - b. *Students know* producers and consumers (herbivores, carnivores, omnivores, and decomposers) are related in food chains and food webs and may compete with each other for resources in an ecosystem.
 - c. *Students know* decomposers, including many fungi, insects, and microorganisms, recycle matter from dead plants and animals.
3. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept:

- a. *Students know* ecosystems can be characterized by their living and nonliving components.
- b. *Students know* that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.
- c. *Students know* many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter.
- d. *Students know* that most microorganisms do not cause disease and that many are beneficial.

Earth Sciences

- 4. The properties of rocks and minerals reflect the processes that formed them. As a basis for understanding this concept:
 - a. *Students know* how to differentiate among igneous, sedimentary, and metamorphic rocks by referring to their properties and methods of formation (the rock cycle).
 - b. *Students know* how to identify common rock-forming minerals (including quartz, calcite, feldspar, mica, and hornblende) and ore minerals by using a table of diagnostic properties.
- 5. Waves, wind, water, and ice shape and reshape Earth's land surface. As a basis for understanding this concept:
 - a. *Students know* some changes in the earth are due to slow processes, such as erosion, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.
 - b. *Students know* natural processes, including freezing and thawing and the growth of roots, cause rocks to break down into smaller pieces.
 - c. *Students know* moving water erodes landforms, reshaping the land by taking it away from some places and depositing it as pebbles, sand, silt, and mud in other places (weathering, transport, and deposition).

Investigation and Experimentation

- 6. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
 - a. Differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations.
 - b. Measure and estimate the weight, length, or volume of objects.
 - c. Follow a set of written instructions for a scientific investigation.

HISTORY AND SOCIAL SCIENCE

4.1 Students demonstrate an understanding of the physical and human geographic features that define places and regions in California.

- 1. Identify the state capital and describe the various regions of California, including how their characteristics and physical environments (e.g., water, landforms, vegetation, climate) affect human activity.
- 2. Identify the locations of the Pacific Ocean, rivers, valleys, and mountain passes and explain their effects on the growth of towns.

- **Grade 5**
SCIENCE

Investigation and Experimentation

6. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
 - a. Classify objects (e.g., rocks, plants, leaves) in accordance with appropriate criteria.
 - b. Develop a testable question.
 - c. Plan and conduct a simple investigation based on a student-developed question and write instructions others can follow to carry out the procedure.
 - d. Identify the dependent and controlled variables in an investigation.
 - e. Identify a single independent variable in a scientific investigation and explain how this variable can be used to collect information to answer a question about the results of the experiment.
 - f. Select appropriate tools (e.g., thermometers, meter sticks, balances, and graduated cylinders) and make quantitative observations.
 - g. Record data by using appropriate graphic representations (including charts, graphs, and labeled diagrams) and make inferences based on those data.
 - h. Draw conclusions from scientific evidence and indicate whether further information is needed to support a specific conclusion.
 - i. Write a report of an investigation that includes conducting tests, collecting data or examining evidence, and drawing conclusions.

ENGLISH LANGUAGE***Reading*****1.0 Word Analysis, Fluency, and Systematic Vocabulary Development**

Students use their knowledge of word origins and word relationships, as well as historical and literary context clues, to determine the meaning of specialized vocabulary and to understand the precise meaning of grade-level-appropriate words.

Word Recognition

1.1 Read aloud narrative and expository text fluently and accurately and with appropriate pacing, intonation, and expression.

Vocabulary and Concept Development

1.2 Use word origins to determine the meaning of unknown words.

1.3 Understand and explain frequently used synonyms, antonyms, and homographs.

1.4 Know abstract, derived roots and affixes from Greek and Latin and use this knowledge to analyze the meaning of complex words (e.g., *controversial*).

1.5 Understand and explain the figurative and metaphorical use of words in context.

Writing**1.0 Writing Strategies**

Students write clear, coherent, and focused essays. The writing exhibits the students' awareness of the audience and purpose. Essays contain formal introductions, supporting evidence, and conclusions. Students progress through the stages of the writing process as needed.

PHYSICAL EDUCATION

Standard 5 – Students demonstrate and utilize knowledge of psychological and sociological concepts, principles, and strategies that apply to the learning and performance of physical activity.

Self-Responsibility

5.1 Improve the level of performance on one component of health-related physical fitness and one identified motor skill by participating in fitness and skill development activities outside school.

5.2 Work toward a long-term physical activity goal and record data on one's progress.

5.3 Distinguish between acts of physical courage and physically reckless acts and explain the key characteristics of each.

5.4 Act in a safe and healthy manner when confronted with negative peer pressure during physical activity.

- **Grade 6**
SCIENCE

Focus of Earth Science

Plate Tectonics and Earth's Structure

1. Plate tectonics accounts for important features of Earth's surface and major geologic events. As a basis for understanding this concept:
 - a. *Students know* evidence of plate tectonics is derived from the fit of the continents; the location of earthquakes, volcanoes, and midocean ridges; and the distribution of fossils, rock types, and ancient climatic zones.
 - b. *Students know* Earth is composed of several layers: a cold, brittle lithosphere; a hot, convecting mantle; and a dense, metallic core.
 - c. *Students know* lithospheric plates the size of continents and oceans move at rates of centimeters per year in response to movements in the mantle.
 - d. *Students know* that earthquakes are sudden motions along breaks in the crust called faults and that volcanoes and fissures are locations where magma reaches the surface.
 - e. *Students know* major geologic events, such as earthquakes, volcanic eruptions, and mountain building, result from plate motions.
 - f. *Students know* how to explain major features of California geology (including mountains, faults, volcanoes) in terms of plate tectonics.
 - g. *Students know* how to determine the epicenter of an earthquake and know that the effects of an earthquake on any region vary, depending on the size of the earthquake, the distance of the region from the epicenter, the local geology, and the type of construction in the region.

Shaping Earth's Surface

2. Topography is reshaped by the weathering of rock and soil and by the transportation and deposition of sediment. As a basis for understanding this concept:

- a. *Students know* water running downhill is the dominant process in shaping the landscape, including California's landscape.
- b. *Students know* rivers and streams are dynamic systems that erode, transport sediment, change course, and flood their banks in natural and recurring patterns.
- c. *Students know* beaches are dynamic systems in which the sand is supplied by rivers and moved along the coast by the action of waves.
- d. *Students know* earthquakes, volcanic eruptions, landslides, and floods change human and wildlife habitats.

Resources

- 6. Sources of energy and materials differ in amounts, distribution, usefulness, and the time required for their formation. As a basis for understanding this concept:
 - a. *Students know* the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.
 - b. *Students know* different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and know how to classify them as renewable or nonrenewable.
 - c. *Students know* the natural origin of the materials used to make common objects.

- **Grade 8**
SCIENCE

Focus of Physical Sciences

Forces

- 2. Unbalanced forces cause changes in velocity. As a basis for understanding this concept:
 - a. *Students know* a force has both direction and magnitude.
 - b. *Students know* when an object is subject to two or more forces at once, the result is the cumulative effect of all the forces.
 - c. *Students know* when the forces on an object are balanced; the motion of the object does not change.
 - d. *Students know* how to identify separately the two or more forces that are acting on a single static object, including gravity, elastic forces due to tension or compression in matter, and friction.
 - e. *Students know* that when the forces on an object are unbalanced, the object will change its velocity (that is, it will speed up, slow down, or change direction).
 - f. *Students know* the greater the mass of an object, the more force is needed to achieve the same rate of change in motion.
 - g. *Students know* the role of gravity in forming and maintaining the shapes of planets, stars, and the solar system.
-

OREGON

- Grade 5
SCIENCE

Earth Science

CCG: The Dynamic Earth: Understand the properties and limited availability of the materials which make up the Earth.

- SC.05.ES.01 Identify properties and uses of Earth materials.
 - SC.05.ES.01.01 *Recognize that Earth materials are used in different ways based on differences in their physical and chemical properties.*
 - SC.05.ES.01.02 *Recognize that soils vary in color, texture, components, reaction to water, and ability to support the growth of plants.*
 - SC.05.ES.01.03 *Recognize that the supply of many resources is limited, and that resources can be extended through recycling and decreased use.*
 - SC.05.ES.01.04 *Recognize that discarded products contribute to the problem of waste disposal.*

CCG: The Dynamic Earth: Understand changes occurring within the lithosphere, hydrosphere, and atmosphere of the Earth.

- SC.05.ES.02 Describe patterns of seasonal weather.
 - SC.05.ES.02.01 *Describe weather in measurable quantities including temperature, wind direction, wind speed, and precipitation.*
 - SC.05.ES.02.02 *Interpret data over a period of time and use information to describe changes in weather from day to day, week to week, and season to season.*
- SC.05.ES.03 Identify causes of Earth surface changes.
 - SC.05.ES.03.01 *Identify effects of wind and water on Earth materials using appropriate models.*
 - SC.05.ES.03.02 *Identify effects of rapid changes on Earth's surface features including earthquakes and volcanoes.*

Life Sciences

CCG: Organisms: Understand the characteristics, structure, and functions of organisms.

- SC.05.LS.01 Group or classify organisms based on a variety of characteristics.
 - SC.05.LS.01.01 *Classify a variety of living things into groups using various characteristics.*
- SC.05.LS.02 Describe the function of organ systems.
 - SC.05.LS.02.01 *Classify organs by the system to which they belong.*
- SC.05.LS.03 Describe basic plant and animal structures and their functions.
 - SC.05.LS.03.01 *Associate specific structures with their functions in the survival of the organism.*

CCG: Diversity/Interdependence: Understand the relationships among living things and between living things and their environments.

- SC.05.LS.05 Describe the relationship between characteristics of specific habitats and the organisms that live there.
- SC.05.LS.05.01 *Use drawings or models to represent a series of food chains for specific habitats.*
- SC.05.LS.05.02 *Identify the producers, consumers, and decomposers in a given habitat.*
- SC.05.LS.05.03 *Recognize how all animals depend upon plants whether or not they eat the plants directly.*
- SC.05.LS.05.04 *Explain the relationship between animal behavior and species survival.*
- SC.05.LS.05.05 *Describe the living and nonliving resources in a specific habitat and the adaptations of organisms to that habitat.*
- SC.05.LS.06 Describe how adaptations help a species survive.
- SC.05.LS.06.01 *Describe changes to the environment that have caused the population of some species to change.*
- SC.05.LS.06.02 *Identify conditions that might cause a species to become endangered or extinct.*

Physical Sciences

CCG: Force: Understand fundamental forces, their forms, and their effects on motion.

- SC.05.PS.03 Describe and compare the motion of objects.
- SC.05.PS.03.01 *Recognize and describe the motion of an object in terms of one or more forces acting on it.*

Science in Social Perspective

CCG: Describe how daily choices of individuals, taken together, affect global resource cycles, ecosystems and natural resource supplies.

SOCIAL SCIENCES

Geography

CCG: Locate major physical and human (cultural) features of the Earth.

- SS.05.GE.03 Locate and identify on maps the continents of the world, the 50 states of the United States, and the major physical features of Oregon.
- SS.05.GE.03.01 *Identify the names of the continents and their relative size, shape, and location.*
- SS.05.GE.03.02 *Identify the names of the fifty states and their location relative to other states.*
- SS.05.GE.03.03 *Locate, identify, and know the significance of major mountains, rivers, and land regions of Oregon.*

PHYSICAL EDUCATION

CCG: Self-Management: Understand and apply safety in movement activities.

ENGLISH

CCG: Vocabulary: Increase word knowledge through systematic vocabulary development; determine the meaning of new words by applying knowledge of word origins, word relationships, and context clues; verify the meaning of new words; and use those new words accurately across the subject areas.

- **Grade 8**
SCIENCE

Earth Science

CCG: The Dynamic Earth: Understand the properties and limited availability of the materials which make up the Earth.

- SC.08.ES.01 Recognize that Earth materials are limited, and explore strategies for addressing this problem.
- SC.08.ES.01.01 *Identify ways in which various resources can be recycled and reused.*

CCG: The Dynamic Earth: Understand changes occurring within the lithosphere, hydrosphere, and atmosphere of the Earth.

- SC.08.ES.03 Describe the Earth's structure and how it changes over time
- SC.08.ES.03.01 *Recognize the solid Earth is layered with a lithosphere, a hot convecting mantle, and a dense metallic core.*
- SC.08.ES.03.02 *Identify the processes that result in different kinds of landforms.*
- SC.08.ES.03.03 *Identify factors affecting water flow, soil erosion, and deposition.*
- SC.08.ES.03.04 *Give examples of landform changes that occur at different rates.*
- SC.08.ES.03.05 *Describe the evidence for and the development of the theory of plate tectonics.*
- SC.08.ES.03.06 *Explain the rock cycle in terms of constructive (crustal deformation, volcanic eruption, and sediment deposition) and destructive (weathering and erosion) forces in land formation.*
- SC.08.ES.03.07 *Describe that the total amount of Earth material stays the same as its forms change in the rock cycle.*

SOCIAL SCIENCES

Geography

CCG: Locate major physical and human (cultural) features of the Earth.

- SS.08.GE.03 Locate and identify on maps and globes the regions of the world and their prominent physical features.
- SS.08.GE.03.01 *Identify the location of major mountain ranges, deserts, rivers, cultural regions and countries in the world.*